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(54) **Opening control device for the loading door of a dry-cleaning machine.**

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US-A- 3 283 548

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Description

The invention relates to a device for measuring the gas concentration of solvent present in the dry-cleaning machine at the end of the drying to allow the automatic opening of the loading and unloading door as soon as a value fixed in advance has been reached.

In a dry-cleaning machine, after the cleaning and treating phases of clothing with solvent and additives, a first drying is carried out by means of heated air which is let pass through the clothing in order to remove the solvent therein contained. Subsequently a cooling is performed in an exchanger arranged for this purpose in order to recover the solvent. As soon as this operation is over, the so called "reduction or deodorizing phase" is carried out which consists of a blasting of the solvent gas concentration and subsequently the loading door can be opened and the clothing taken away.

Apparatuses are known, as for instance the apparatus described and shown in the Us-A-3 283 548, according to which a latch on the door is arranged to hold the door in closed position. But currently no checking of the solvent gas concentration in reduction phase exists, and an empirical system is used, i.e. basing on tests performed previously in which it was established that, in order to obtain the required value, this reduction phase must be carried out during a certain time. This current checking system, however, does not give assurance since many factors may affect it in different ways and determine values of gas concentration which may differ even substantially from the ones foreseen during the tests. Among these factors, also the kind of the handled clothing, the use condition of the dry-cleaning machine, as well as the condition and the kind of the used solvent must be taken into consideration.

Therefore, the drawbacks are evident that affect a system like the one now used and based on previous tests. Furthermore, it has to be born in mind that the present sanitary and anti-pollution rules in force in many European Countries require that, at the end of the cleaning cycle, the solvent concentration in the machine inside as well in the clothing do not exceed a maximum fixed value, so that, when the loading door is opened, the workers are not intoxicated and the surrounding is not polluted.

The invention allows the total solution of the problem by fitting the dry-cleaning machine with a device for checking the gas concentration degree of the solvent contained in the machine inside. This device, by adopting either one or more measuring elements and by means of a control device, when the fixed value has been reached opens automatically the loading and unloading door allowing to take up the clothing from the basket inside the machine.

The invention foresees a probe 1 in the dry-cleaning machine inside consisting of two electrodes for the momentanous measuring of the ohmic resistance of the air interposed between the two electrodes. Since this resistance changes according to the gas concentration existing in the machine, this probe measures the solvent gas concentration degree existing on that moment in the machine inside. Said probe is connected to an electronic circuit 2 which, when the value fixed in advance has been reached, stops the air circulation inside the machine. The invented device is illustrated in an indicative way in the drawings of sheet 1.

Fig. 1 is schematic view of the dry-cleaning device to show the position of the probe 1.

Fig. 2 is the basic scheme of measuring system of the gas concentration which controls the pneumatic piston which disengages the latch of loading-unloading door.

An electronic circuit 3, at last, controls an electrovalve 4 which activated a pneumatic piston 5 so disengaging the latch 6 of the loading door. In an embodiment, the probe 1 is positioned in duct 7 to measure the gas solvent concentration existing in the air coming from the drum 8 and sucked up by means of the fan 9. In order to change the concentration value at which the probe must intervene, a potentiometer is arranged in the electronic circuit 2 at the outside of the machine. The probe 1 in additional is arranged like an auxiliary outside detector at an air exit from the machine. On this exit a container of activated carbons can be fitted to keep back the gas. When this probe shows an outlet gas concentration, it is necessary to intervene to regenerate the carbon. The use of the probe fitted outside enables both to observe the solvent gas concentration so stopping by means of the electronic circuit the fan 9, and to observe an anomaly in the operation of the machine.

Claims

1. Opening control device for the loading door of a dry-cleaning machine depending on the gas concentration of the solvent gas, with an electrovalve (4) which disengages a latch (6) of the loading door when the cleaning is finished, characterized by the fact that a probe (1) is foreseen inside the machine, the probe consisting of two electrodes for the momentanous measuring of the ohmic resistance of the air interposed between the electrodes connected to an electronic circuit, which stops the air circulation inside the dry-cleaning machine when a prefixed value of the resistance of the

air between the electrodes has been reached, and by the fact that the electrovalve operates a pneumatic piston connected to the latch.

2. Opening control according to claim 1, characterized by the fact that the probe (1) is positioned in a duct (7) leading from the drum (8) to a fan (9).

3. Opening control according to claim 1, characterized by the fact that a potentiometer is arranged in the electronic circuit (2) at the outside of the machine.

4. Opening control according to claim 1, characterized by the fact that an additional probe (1) is arranged at an air exit from the machine after the air passed through a container of activated carbon, the electronic circuit stopping the fan (9) when the activated carbon requires regeneration.

Patentansprüche

1. Vorrichtung zum Steuern des Oeffnens der Ladetür in Trockenreinigungsmachines mitells eines elektrischen Ventils (4), dessen Wirking von der gasförmigen Konzentration des lösenden Gas abhängt, und welches einen Riegel (6) der Ladetür losläßt, wenn di Reinigung ferdig ist, daduch gekennzeichnet, daß eine Sonde (1), die im Inneren der Machine eingesetzt ist; diese Sonde bestehend aus zwei Elektroden für die augenblicklische Messung des Widerstandes der Luft, die sich zwischen die Elektroden findet, welche mit einem elektronischen Stromkreis verbunden ist, der den Luftumlauf in Inneren der Trockenreinigungsmachine unterbricht wenn ein bestimmter Wert des Luftswiderstandes zwischen die Elektroden erreicht wird; und von einem mit dem Riegel zusammengefügt Luftkoblen der von dem elektrischen Ventil angetrieben wird.

2. Vorrichtung zum Steuern des Oeffnens nach Anspruch 1), dadurch gekennzeichnet, daß die Sonde (1) in der Leitung (7) von dem Faß (8) bis den Ventilator (9) gestellt ist.

3. Vorrichtung zum Steuern des Oeffnens nach Ansprch 1), daduch gekennzeichnet, daß der Potentiometre außen der Machine in dem elektronischen Stromkreis (2) gestellt ist.

4. Vorrichtung zum Steuern des Oeffnens nach Anspruch 1), dadurch gekennzeichet, daß eine Hilfessonde (1) in einer ausstrittsöffnung der Luft von der Machine gestellt ist, nachdem die Luft durch einen Kasten mit aktiver Kohle gegangen ist; der elektronische Stromkreis unterbricht den Ventilator (9), wenn die aktive Kohle eine Regeneriegung braucht.

Revendications

1. Dispositif de commande d'ouverture de porte de chargement dans les machines de nettoyage à sec par rapport à la concentration gazeuse du gaz détergent avec une électrovalve (4) qui débloque un verrou (6) du hublot de chargement lorsque le nettoyage s'est terminé, caractérisé par le fait qu'il est équipé d'une sonde (1) située à l'intérieur de la machine; la dite sonde, qui est constituée de deux électrondes pour le mesurage momentané de la résistance ohmique de l'air se situe entre les deux électrodes branchées à un circuit électronique, la dite sonde interrompt la circulation de l'air à l'intérieur de la machine de nettoyage à sec quand la valeur préétablie de la resistance de l'air entre les électrodes a été atteinte; et par le fait que l'électrovalve opère un piston pneumatique connecté au verrou.

2. Dispositif de commande d'ouverture, selon la revendication 1), caractérisé par le fait que la sonde (1) est située dans un canal (7) provenant du tonneau (8) jusqu'au ventilateur (9).

3. Dispositif de commande d'ouverture, selon la revendication 1), caractérisé par le fait qu'il est équipé d'un potentiomètre situé à le circuit électronique (2) à l'extérieur de la machine.

4. Dispositif de commande d'ouverture, selon la revendication 1), caractérisé par le fait qu'il est équipé d'une sonde auxiliaire (1) située près d'un trou de sortie d'air de la machine après le passage de l'air à travers une cuve de charbon actif, le circuit électronique arrête le ventilateur (9) quand le charbon actif nécessite une régéneration.

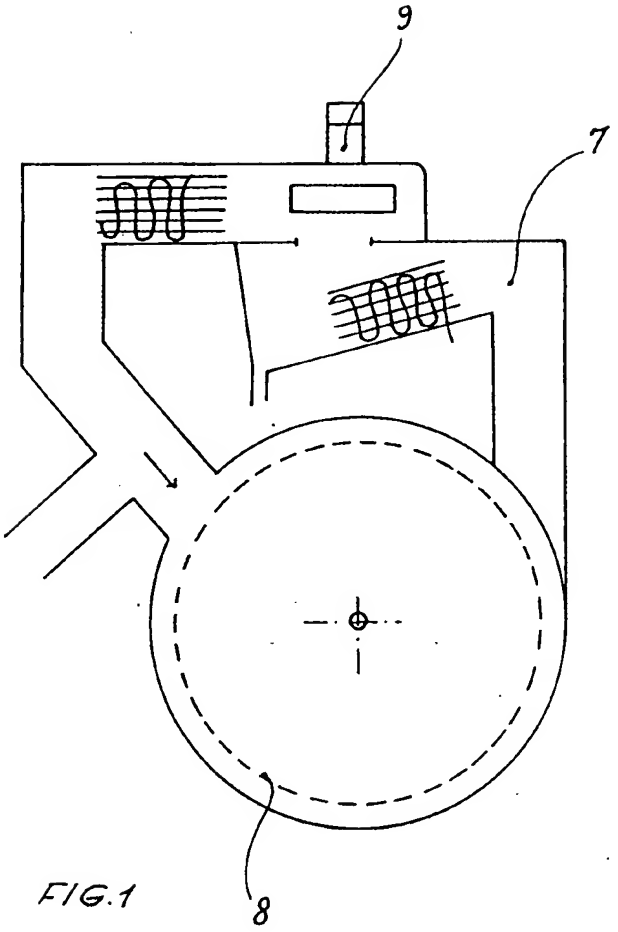

FIG.1

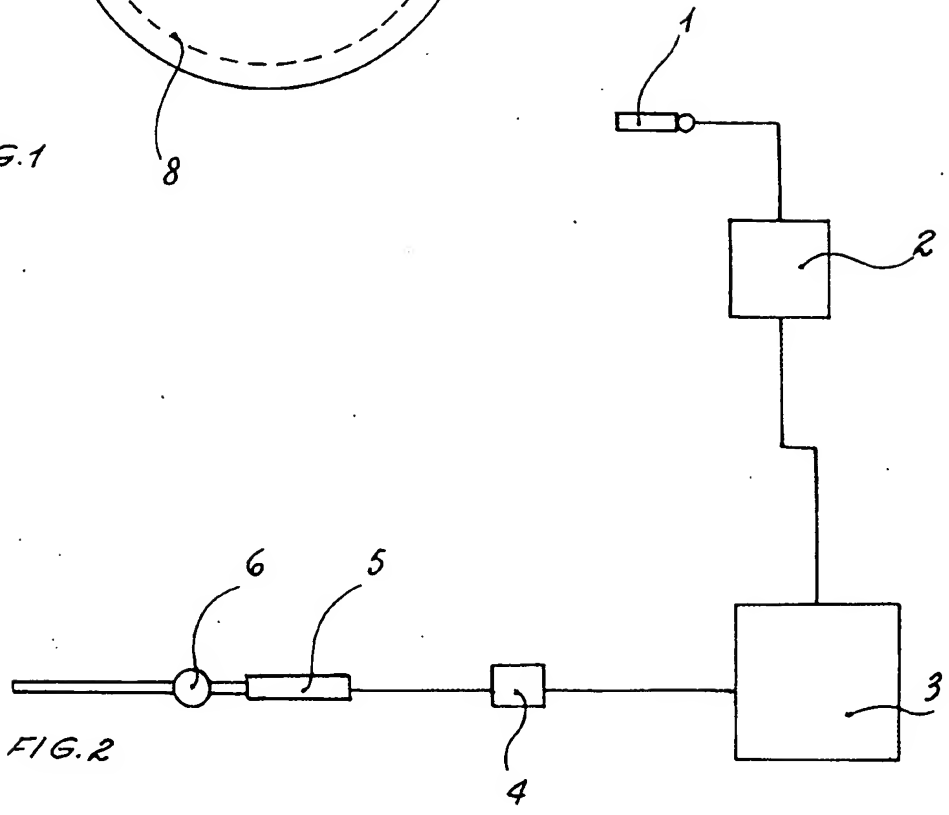

FIG.2